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THE
NATURAL HISTORY
OF
BRITISH INSECTS;

EXPLAINING THEM
IN THEIR SEVERAL STATES,
WITH THE PERIODS OF THEIR TRANSFORMATIONS,
THEIR FOOD, OECONOMY, &c.

TOGETHER WITH THE
HISTORY OF SUCH MINUTE INSECTS
AS REQUIRE INVESTIGATION BY THE MICROSCOPE.

THE WHOLE ILLUSTRATED BY
COLOURED FIGURES,
DESIGNED AND EXECUTED FROM LIVING SPECIMENS.

By E. DONOVAN, F.L.S. 16

IN TEN VOLUMES.

VOL. I.

LONDON:

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FOR THE AUTHOR,
And for F. and C. RIVINGTON, N° 62, ST. PAUL'S CHURCH YARD.
MCCCCII.

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THE FIRST PART

COLLECTED BY

DESIGNED AND EXECUTED FROM LIVING SPECIMENS.



BY EDWARD DAVY, F.R.S.

IN TEN VOLUMES

VOL. I.

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PRINTED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD.

FOR THE AUTHOR,

And for E. and C. RIVINGTON, No. 55, St. Paul's Church-Yard.

1800.

TO
T. MARSHAM AND A. M'LEAY, ESQRS.
TREASURER, AND SECRETARY,
OF THE
LINNÆAN SOCIETY.

MY DEAR SIRs,

IF I were not anxious to acknowledge you amongst the number of those, whose useful information has in various instances tended to improve this Work, motives of esteem would alone induce me to inscribe it to you. The reflection, that for ten years past, it has been sanctioned with no inconsiderable share of public approbation, will not allow me to believe it unworthy of your attention, and its conclusion affords me the best opportunity to testify the favour,* as well as the respect, with which

I remain,

Most sincerely yours,

E. DONOVAN.

T. MARSHAM AND A. M. HAY, ESQ.

TREASURER AND SECRETARY

LINNEAN SOCIETY

AT DEAR SIR,

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Yours sincerely

E. DONOVAN

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AT the conclusion of a Work which has been published in a progressive manner, and either in the form of Monthly Numbers or Annual Volumes has already passed the ordeal of public criticism, the Author can have little to advance in favour of the design, or the manner in which it has been executed. His chief object was to illustrate the science of Entomology on a more extensive scale than had been previously attempted in this Country, and he trusts, upon the whole, his endeavours in this respect have not been fruitless.

As a general History of the Insect Productions of Great Britain, it is presumed this Work will be found sufficiently copious and instructive; for though the Author has purposely avoided entering too deeply amongst the minutiae of the Insect race, he has been careful to include whatever is interesting. The selection of Papiliones or Butterflies is extremely ample, as well as that of the Sphinges

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or Hawk Moths: none of the larger kinds of *Phalaenæ* or Moth tribes have been over-looked, and the number of those of an inferior size that are extremely rare, or particularly beautiful, are altogether considerable. Those are chiefly alluded to, because general observers are more immediately interested with the uncommon elegance of the *Lepidopterous* tribes than any others. In general, however, the reader will meet with some information in every department, as nothing material in any cabinet to which he has access has been omitted.

The arrangement of the subjects is for the most part conformable to the system of *Linnaeus*, with occasional reference to the writings of *Fabricius*. This is designed to assist the labours of the practical Entomologist, and by combining novelty with beauty, and scientific information, may induce many other attentive observers of nature to pursue this pleasing and interesting study.

The Author cannot but feel some degree of satisfaction in having at least fulfilled the chief object of his first design, and after the labour of ten years completed a Work, perhaps the most extensive that may ever appear in this form on the subject of British Entomology; but this consideration will not permit him to entirely abandon his favourite pursuit: his attention will be still directed to a science in which the past indulgence of a liberal public,

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lic, have induced him to believe he may still be useful, and though he cannot, consistently with the conditions of this undertaking, extend it further at this time, should a sufficient number of new and valuable species occur, he will certainly be tempted to transgress, and make some addition to the present selection.

ALPHA-

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addition to the present edition.

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A

SLIGHT SKETCH

OF THE

ANIMAL SYSTEM.

LINNÆUS divided the Animal System into six classes.

- Class I. MAMMALIA. Suckle their young.
II. AVES. (Birds) covered with feathers.
III. AMPHIBIA. Lungs arbitrary.
IV. PISCES. (Fishes) breath by gills not arbitrarily.
V. INSECTA. (Insects) two antennæ, or feelers*.
VI. VERMES. No head.

Insects therefore compose the fifth Class in the System, and are divided into seven Orders.

- Order I. COLLEOPTERA. Wings two, covered by two shells divided by a longitudinal future.
II. HEMIPTERA. Shells or covers of the wings, somewhat soft, and incumbent on each other.
III. LEPIDOPTERA. Wings four, imbricated with minute scales.

* Those feelers are the two horns that are affixed to the head.

IV. NEUROPTERA. Wings four, naked, transparent, reticulated, with veins or nerves. Tail without sting.

V. HYMENOPTERA. Wings four. Membranaceous. Tail of the female armed with a sting.

VI. DIPTERA. Wings two.

VII. APTERA. No wings.

TRANSFORMATIONS OF INSECTS.

Many of our readers are no doubt acquainted with the singular transformations Insects undergo, but we trust those will pardon a digression which may be useful to those who have not that knowledge; and without premising farther we proceed to inform them, that Insects in general undergo a material change in their form at stated periods of their lives; there are some, though few, which burst forth from the egg perfectly formed, as *Spiders*, &c. but the greater part exist in four several states: the first that of the egg, whence the Larva, or Caterpillar is produced; it is at first very minute, but in this state it feeds, some kinds on one or two plants only, others promiscuously on many, they therefore continue to increase in size, moulting several times the outer skin, until the destined period of their dormant state approaches; they then spin a web more or less strong according to the species, and are converted into the aurelia, or chrysalis; and lastly they burst forth in due season perfectly formed. It is under this form they propagate a future race, and themselves perish, as they rarely survive the inclemencies of the winter.

The antient naturalists held suppositions very imperfect and erroneous relative to those transformations, but *Malpighi* and *Swammerdam* proved by many accurate examinations clearly, that those changes were not suddenly effected, but gradual; and that under the form of the Caterpillar they could distinguish the future changes the Insect would undergo.





P L A T E I.

PHALÆNA PAVONIA;

EMPEROR MOTH.

LEPIDOPTERA.

Insects of the LEPIDOPTERA ORDER are divided into three *Genera*, PAPILIO, SPHINX, and PHALÆNA, *Butterflies*, *Hawk Moths*, and *Moths*. The characters of the two former hereafter: those of the Phalæna are

GENERIC CHARACTER.

The antennæ setaceous, decreasing in size from the base to the apex. The wings, when at rest, are generally contracted. They fly in the night.

SPECIFIC CHARACTER.

Antennæ feathered. No trunk. Wings expanded, horizontal, rounded, entire, with a large eye in the center of each; the first red-brown waved; the second orange. The antennæ of the male are broader, and the wings of the female larger, waved with black and white and bordered with yellow. Caterpillar green or yellow, spinous, on thorns and brambles. Length of the moth one inch.—*Berken. Out.*

The conformity and likeness which prevails between the male and female throughout the greater part of the animal system, cannot however in Insects be implicitly depended on; the difference in many is such as even to mislead some very accurate Entomologists, the illustrious Linnæus not excepted. In this species it is not so great as

in many, but such as entitles the female to a figure in a future plate: Our figure is of the male.

Albin, (*Plate 25, Subject 37,*) has given a figure of the male and female on the same plate, and describes a male to have changed to the aurelia state as in our plate represented *July 16*, and *March 18* following to have produced the Fly. But the time of their appearance depends on the proportion of heat or cold; as the author's subject was preserved from the severity of winter, in a warm room. The usual time to find them in the caterpillar state is August, and in April the Fly.

The singular provision which nature makes for the protection of this Fly deserves particular notice; when the time of its continuation in the caterpillar state is expired, by much labour it forms a kind of bag or purse, of a very tough substance; this it fixes against the trunks of trees, &c. by a number of hairs or filaments, which remain on the external surface. It lines the outer case by one of a finer texture, the top of which is closed by several bristles that unite in the center, exactly representing a cap, and excludes almost the possibility of its receiving an injury during this defenceless state. In this bag it passes to the aurelia, and remains until the birth of the perfect insect.—Our figure represents the chrysalis or aurelia in the bag; part appears torn away to exhibit its situation therein.

Were we to unite the several accounts of authors respecting its food, it would appear to be a general feeder; it will live on the rose, the elm, and the willow; and on thorns and brambles particularly.



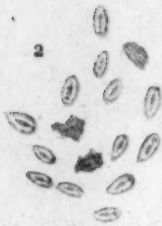
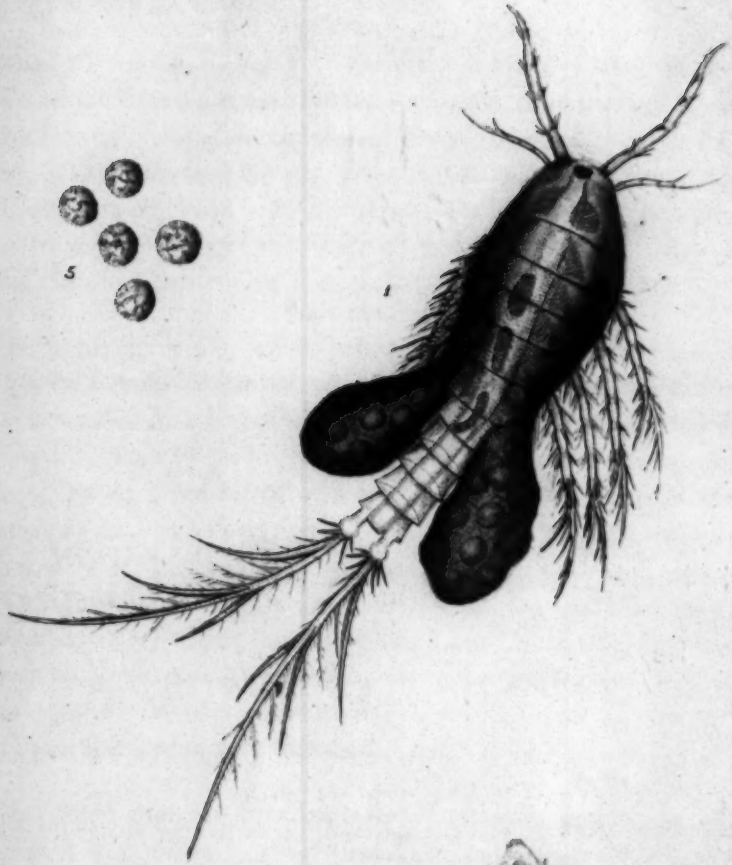


PLATE II.

FIG. I.

MONOCULUS QUARICORNIS.

APTERA.

Apterous insects are distinguished chiefly by having no wings in either male or female.

GENERIC CHARACTER.

The feet are formed for swimming. The body is covered with a crustaceous case or shell. The eyes fixed in the shell very near each other.

SPECIFIC CHARACTER.

Grey brown. One eye. Antennæ four. Body diminishes towards the tail, which is long and bifid, with three or four strong hairs on each side. A bag of eggs on each side of the tail. Length half a line.—*Berk. Out.*

Although this insect may have been noticed by many, swimming, or rather darting swiftly in various directions in water; its minuteness is such, that the most attentive could never have comprehended precisely its component parts; but the microscope discovers it to be an animal of such singular formation as highly to deserve the attention of the naturalist. It is covered by a firm crustaceous substance, divided into annulations, and armed in several parts with spines and bristles; not-

notwithstanding which, this shell is so transparent that the whole motion of the intestines is very visible by a good magnifier.

It must be granted that, but for the microscope, the wonders of the minute creation, would be to us entirely unknown; our ideas could never suppose the existence of those animated forms which occupy the immeasurable space between an apparent atom and nothing. The myriads of animals, thousands of times smaller than a mite, must evade our cognizance, and be an actual conviction of their non-existence.

But with all the utility that the microscope can boast, no instrument is so likely to mislead the most accurate observer, particularly if not in the habit of using it; the variations of light, the difference of the magnifying powers, or the damage the glasses may meet with by accident, such as requires every one to examine with the greatest care; one degree of light may bring an object to view, whilst another may entirely blend it with the fluid it exists in; or one glass may discover spines on an object, another glass might have represented perfectly smooth; it is therefore necessary to begin with a small power, in proportion to the size of the object, and to proceed to deeper magnifiers after.

There is some difference in our figure, and those either of *Barbut*, or of *Baker*, which appears chiefly from our using a single lens nearly of the deepest power convenient to use. Our glasses were the 20th and 30th of an inch focus.

We very attentively examined the eyes, and found, not one, but two, placed near each other, on a scale or plate of a black colour; hence arises the appearance of a single eye by a small magnifying power.

The tail presents a forked appearance by a deep power, and the eggs are contained in two bags, one on each side the tail. The colour varies probably in proportion to the nature of its food, to pale green, more or less of a red, or of a grey brown colour.

FIG.

PLATE II.

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FIG. II.

This minute animalcula is frequent in stagnant water, or in infusions of vegetables, and is one species of those whose existence can only be discovered by a good microscope. It is very difficult, considering the power those creatures have to distort their true form at pleasure, to fix their distinguishing character: therefore where the definition appears dubious, we prefer being silent rather than hazard an error.

FIG. 2. Represents them (*magnified*) as they sometimes seem to follow the leader in herds; but perhaps it is only the scent of the prey that induces each to follow the foremost, as they frequently swim or whirl in the water separately, with great swiftness, devouring the smaller kinds of animalculæ.

FIG. 3. Two, magnified by a deep power, when they appear to have feet or fins.

FIG. 4. Shews the strange form it assumes whilst depositing its eggs.

FIG. 5. The eggs deeper magnified.

PLATE

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P L A T E I I I.

P H A L Æ N A B U C E P H A L A,

B U F F - T I P M O T H.

L E P I D O P T E R A.

G E N E R I C C H A R A C T E R.

Antennæ taper from the base to the apex, and are setaceous. Wings in general deflected when at rest. Fly by night. No Trunk. Wings reversed, i. e. first Wings horizontal and second erect.

S P E C I F I C C H A R A C T E R.

Antennæ feathered. First Wings grey, with two double transverse brown waves, and a large yellowish brown spot at the extreme angle. Second Wings plain, light yellow, length scarce one inch. Caterpillar hairy, yellow with black spots. On Oaks, Ash, &c.—*Berkshout.*

The delicate assemblage of beautiful down which cloath the upper wings of the Buff-tip Moth is its chief recommendation; the history affords but little for observation, it is hatched from the egg in *August*, and in *June* following the Fly is perfect.

Its beauty preserves it not from the race of birds who pursue it from necessity, or from an innate desire of cruelty and devastation, and
 4 whilst

whilst happy in its apparent security, ranging the plain to experience the pleasures of liberty, or to banquet in the nectareous profusion of the vegetable kingdom, he becomes a dupe to his happiness, his pleasures at once sully, and he falls an unresisting victim into the devouring jaws of death.

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P L A T E IV.

PHALÆNA GROSSULARIATA.

MAGPYE, or CURRANT-MOTH.

GENERIC CHARACTER.

The antennæ setaceous, decreasing in size from the base to the point: The Wings, when at rest, generally deflected. Fly by night.

Antennæ taper, like bristles.

SPECIFIC CHARACTER.

Antennæ and Legs black. Body yellow, with black spots. Wings white, with many black patches, and a transverse yellow wave on the first pair. Caterpillar white, with black spots on the Back; Belly yellow. *Berk. Out.*

The Magpye-Moth is one of the *geometræ*; and feeds on Gooseberry and Currant-bushes, as the name indicates. The Caterpillar is found in *May*; and in *July*, the Fly.

The Caterpillar, previous to its change to the Chrysalis state, spins a web of a very slight and delicate texture, by which it is suspended horizontally against the branches of trees, &c. as in our Plate represented.

PLATE IV

THE TEMPLE OF VENUS

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The temple of Venus was situated on the right bank of the Tiber, near the mouth of the river. It was dedicated to the goddess Venus, who was worshipped as the patroness of love and beauty.

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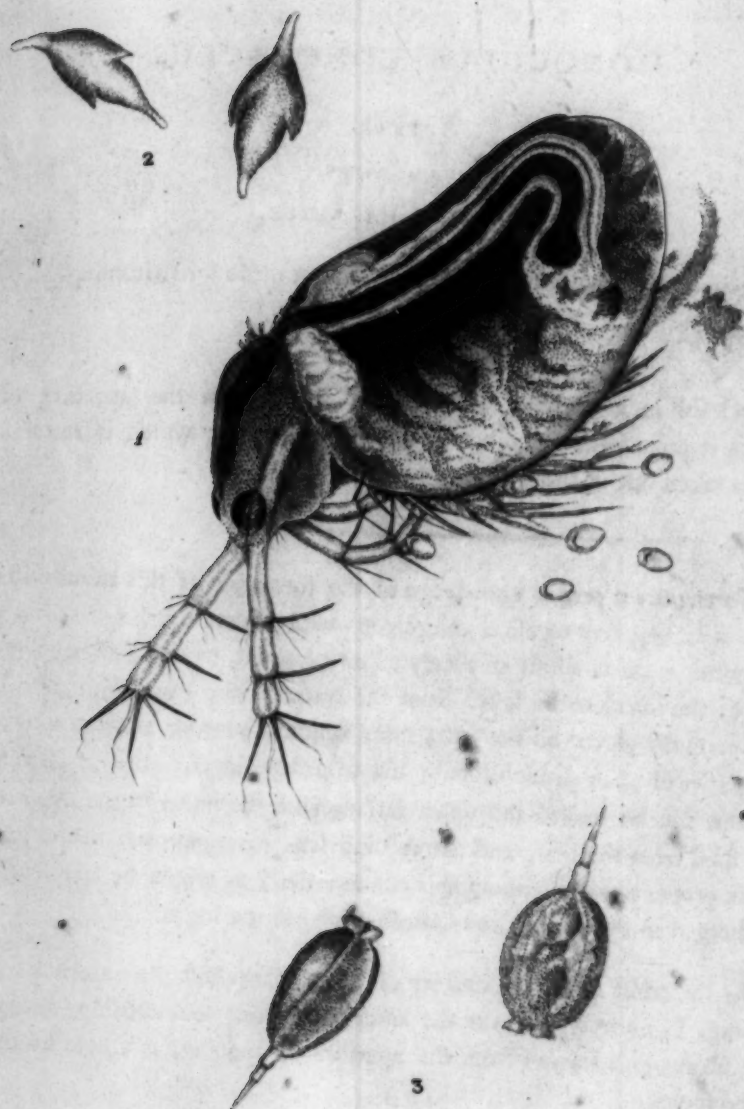


PLATE V.

FIG. I.

MONOCULUS CONCHACEUS.

APTERA.

Without wings.

GENERIC CHARACTER.

Body covered with a crust or shell. Feet made for swimming.

SPECIFIC CHARACTER.

Inclosed in a bivalve, ash-coloured shell, from the aperture of which it puts forth a number of capillary antennæ, which it retracts when taken out of the water.

To acquire a proper knowledge of the formation of this minute insect, it is necessary to use a microscope with a glass stage for objects, or rather such as admit of nicely adjusting a talc as occasion may require: the insect to be taken from the water with a camel-hair pencil, and carefully placed on the talc; after which it may be examined by a magnifier of $\frac{1}{10}$ of an inch focus; but in proceeding to a deeper power, let the talc be turned the upper surface with the insect in the drop of the fluid from the lens, and thereby the lens may approach the object to its proper focus; without this caution the lens would be frequently immersed in the water, and entirely obstruct the sight.

In the adult state, the opacity of the bivalve shell, its external covering, so entirely obscures the internal motion, that nothing, except the filaments it throws from the aperture or opening, is visible by the microscope,

It breaks from the egg perfectly formed, but very minute and transparent; this is therefore the best time to discover its structure, and from one in this state we have taken our figure

By

By the antennæ it directs its course, as does the *Monoculus Quadri-cornis*; and like it also it hath two eyes fixed in the shell, but it can completely envelop its head in its bivalve covering; its mouth is beneath, but the numerous filaments it darts forth, causes such a violent motion in the water, that the minuter insects are unresistingly drawn between them, and forced to the mouth.

The motion of its lungs is very visible, as are also the vessels ramifying thence. Its food is carried to, and digested in the deep-coloured tube, or intestine, and the refuse is discharged by a sudden jerk from the extremity of the tube, or anus.

Thus it exists, a life of rapine and destruction, enjoyed at the expence of the lives of thousands; and as the objects of its ravenous disposition are defenceless, so are they the sport of their conqueror: the few moments of intermission its craving appetite grants them, is occupied equally in the spoil, first pressing them to death, and then tossing them undevoured into the fluid.

But should a more powerful insect oppose him, he immediately contracts his parts, and nothing more than the external covering is open to his antagonist's violence, and he will sooner die ignobly than offer the least opposition.

FIG. II.

This animalcule is very minute, and appears like a fine membrane without intestines before the microscope; from the appearance of its winged sides, it is supposed to resemble a bird. It is called *Bursaria Hirundinella*.

FIG. III.

The back and side view of an animalcule found in ditch-water on duck-weed, very pellucid, and singularly marked in the intestines; tail moveable, and thereby it directs its course.





P L A T E VI.

SPHINX FILIPENDULÆ.

BURNET MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Sphinx, Antennæ thickest in the middle. Wings, when at rest deflexed. Fly slow, morning and evening only.

SPECIFIC CHARACTER.

Antennæ, Legs, and Body black. Second Wings red, with a greenish border. First Wings bluish green, with six red spots, in pairs, length eight lines. Caterpillar yellow, with black spots.

Linn. Syst. Nat. 2. 805. 34. *Fn. Sv.* 1097.

Papilio Phalæna Ariës. Degeer *Inf.* 7. 591. 1 *Tab.* 44. *Fig.* 1.

We have two kinds of *Burnet-Sphinx*, distinguished by the appellations of *Five-spot*, and *Six-spot*, *Burnets*; though often considered only as varieties, or difference of sex, they appear to be two distinct species; not only that they are commonly found in parts of the country very remote from each other, but the number and situation of the small red spots which adorn the Superior Wings, constitute a material distinction. The *Six-spot* is taken near the environs of

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London, where the other is rarely if ever found, and in some parts of Bedfordshire the *Five-spot* is very common.

As all Lepidopterous Insects undergo some trifling alterations from attendant circumstances, so specimens of the female *Sp. Filipendulae* has been taken with the two spots near the base of the Wing closely united; and hence arose some doubt as to the existence of any other *Five-spot Burnet*; the two kinds must not, however, be compared to entertain this supposition, as the *Five-spot* is not only smaller, the margin of the Inferior Wings deeper, but wants that spot of red nearest the Apex of the Superior Wings, and which must immediately appear on the slightest inspection.

The Caterpillars of most Insects of this genus are armed with a spine, or horn, above the anus, in which particular the Caterpillars of our species, does not agree. It feeds on the *Genista Anglica*, needle furze; on the *Ulex Europæus*, common furze; and on the *Filipendula*; those plants flourish in a sandy soil, where the Caterpillars are to be sought, in May, and June: the Sphinx appears in July.





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PLATE VII.

CHYSIS IGNITA.

HYMENOPTERA.

Wings four, generally membranous. Tail of the females armed with a sting.

GENERIC CHARACTER.

The abdomen hath three annulations exclusive of the anus, the antennæ hath twelve articulations, exclusive of the first joint which is longer than the rest. The body shines like polished metal. A kind of collar is very distinct in this genus. The anus is dentated, having one, two, or more teeth.

SPECIFIC CHARACTER.

The antennæ are black, the thorax a fine mazarine blue, having in some positions a greenish cast, the abdomen a fine gold colour with shades of crimson and yellow green; the anus hath four teeth or denticulations.—*Syst. Ent.* 358. 6. *Linn. Syst. Nat.* 2. 947. 1. *Fn. Sv.* 1665.

Exotic Insects, or at least those of the East, and West Indies, for the effulgence, and beauty, of their colouring in general, claim a superiority over the natives of this climate; but the appearance of this Chrysis before the speculum of an opake microscope, may vie with many of the most favourite foreigners hitherto discovered; the richness

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of

of changeable colours blending into each other, according to the variations of the light reflected on the surface, is such that we freely confess our inability, or even the inability of art, to equal; though we trust our figure will give some idea of the delightful appearance of the original.

The Fly of the natural size is given on the fore ground, the magnified figure above.

It commonly constructs its habitation in the chinks of old walls, or decayed trees, but prefers a situation near the entrance of woods where it may reside in silent security. If attacked by any Insect of equal size, it is generally victorious, for such is the amazing strength of its almost impenetrable coat, that it will encounter the spider without much apprehension of danger; and as its strength protects it from many injuries which Insects with tender bodies are exposed to; the species multiplies, and is not uncommon in several parts of the country. It rarely appears from its retreat until the middle of the day, and is then only invited by the piercing rays of the sun.



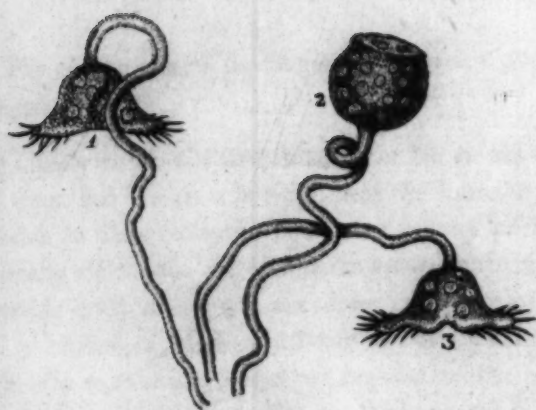


PLATE VIII.

VORTICELLA LUNARIS.

GENERIC CHARACTER.

A worm capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Simple, hemispherical, with a twisted pedicle.

“ The small head of this animalculum is crater-form, the margin
 “ of the orifice protuberant, ciliated on both sides, the hairs undula-
 “ ting, the pedicle eight or ten times the length of the body. As
 “ often as the mouth is opened, the pedicle extends itself; when it is
 “ shut, this is twisted up spirally, and their motions are often reite-
 “ rated in a short space.

“ FIG. 1. the head, expanded.—FIG. 2. when shut.—FIG. 3.
 “ the undulated edge.”

Müller. Ani. Inf.—Adams's Essays on the Microscope.

FIG. 4. found in infusions of hay, and is called *Trichoda Uvula*.

PLATE VIII.

VORTICELLA LUNARIS.

GENERIC CHARACTER.

A worm capable of contracting or extending itself, naked, with
sensitive cells.

SPECIFIC CHARACTER.

Simple, headless, with a twisted pedicel.

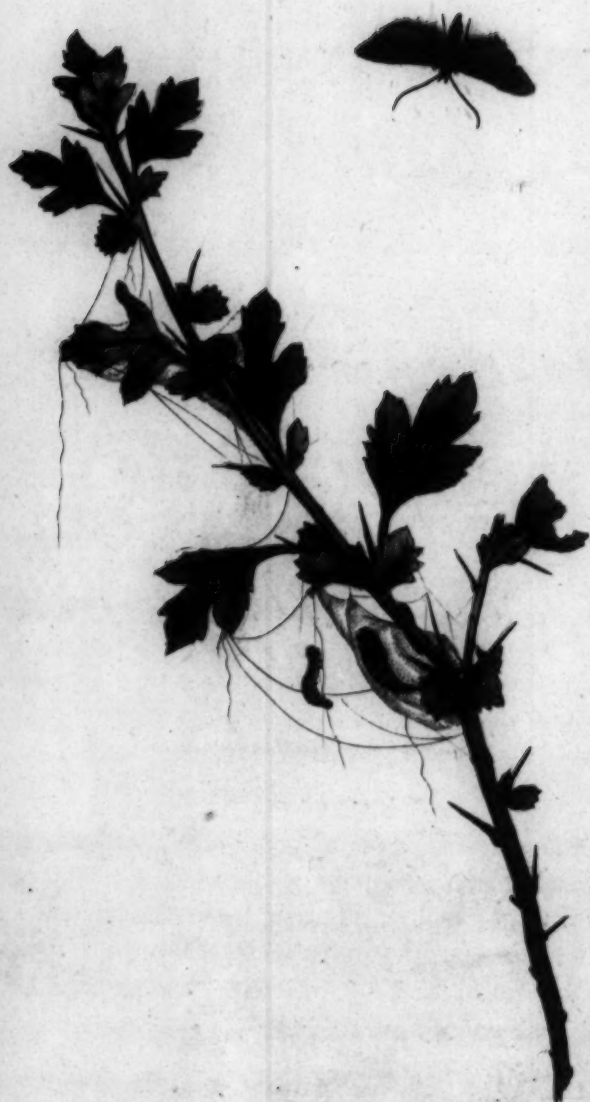
" The first head of this animal is circular, the margin
" of the outer membrane, raised on both sides, the hairs undula-
" ting, the pedicel eight or ten times the length of the body. As
" soon as the animal is placed, the pedicel extends itself, when it is
" that this is twisted up spirally, and then becomes and often con-
" tracted in a short space.

" Fig. 1. the head, expanded. Fig. 2. when the
" the undulating edge.

Fig. 3. the head, expanded. Fig. 4. when the

Fig. 4. showing the head, and is called *Vorticella lunaris*.





to prove them either varieties of each other, or distinct species. I have distinguished them as distinct species. They differ in colour, the Caterpillars of one being light yellow brown, the other black, and the upper edge of the wings of the latter is more than that of the former.

PHALÆNA EVONYMELLA.

SMALL ERMINE MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ taper like bristles.

SPECIFIC CHARACTER.

First Wings silver-white, with fifty black spots in three or four rows,
Second wings lead-colour.

Syst. Ent. 656. 4. *Linn. Syst. Nat.* 2. 885. 350. *Fn. Sv.* 1363.

Phalæna Evonymella feeds on the white-thorn, black-thorn, and on fruit trees. In May the caterpillars are hatched, and as they live in societies of hundreds, or even thousands, by their united industry they spin a web spacious enough to contain the family, and therein they assume their several forms; early in June they become chrysalides, and in about fourteen days the Flies are perfect.

The caterpillars of the *Pha. Padella* and *Evonymella* are ever found in the same society, and many circumstances may be advanced

to

to prove them either varieties of each other, or difference of sex only, although Linnæus considered them as distinct species. They differ in colour, the Caterpillars of one being light yellow brown, the other black, and the upper wings of the *Evenymella* are less of a lead colour than those of the *Padella*.

To gain information on this subject, we, this season, put the eggs of several females into different glasses; the eggs of each female produced both kinds of Caterpillars, they became Chrysalides, and a number of each sort of the Flies came forth.

PLATE

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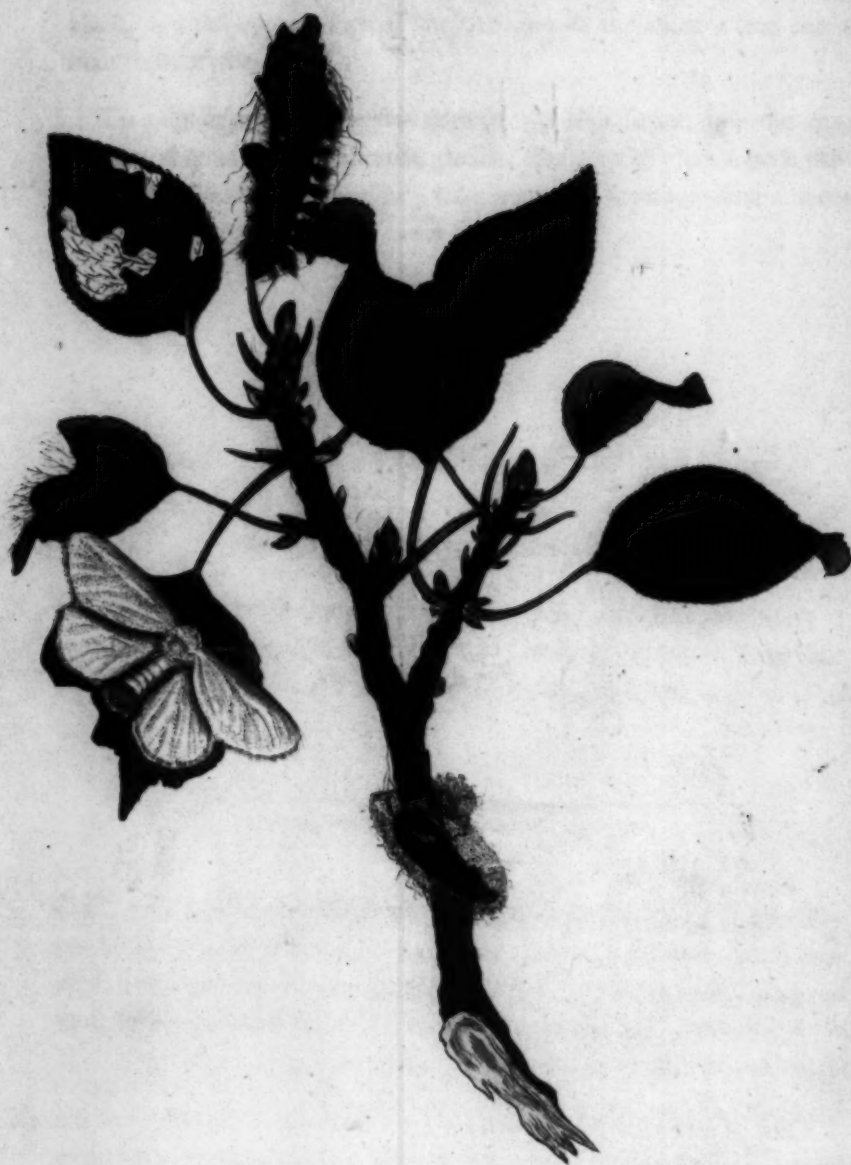


PLATE X.

PHALÆNA CHRYSORRHŒA.

YELLOW TAIL MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

No trunk. Wings depressed, deflexed. Back smooth.

SPECIFIC CHARACTER.

Antennæ feathered. Entirely white, except the extremity of the abdomen, which is yellow. Caterpillar black and red, hairy.—

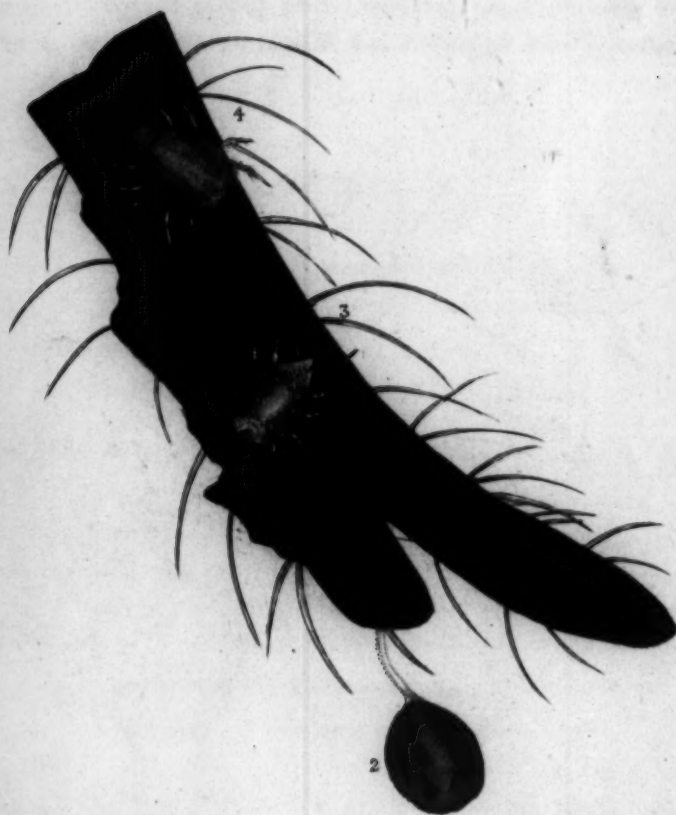
Syst. Entom. 577. 74. *Linn. Syst. Nat.* 2. 822. 45. *Fn. Sp.* 1128.

Linnaeus in the *Systema Naturæ*, has confounded the *Yellow Tail*, with the *Brown Tail Moth*, nor was it generally considered as an error till some time after; but the immense increase of the Caterpillars of the *Brown Tail Moth* in the year 1780, afforded an opportunity of determining them to be distinct species.

Though foreign to our purpose, and properly under the history of the *Brown Tail Moth*, we cannot pass over such remarkable circumstances as attended the uncommon increase of this species in the above winter.

The





P L A T E X I.

ACARUS COLEOPTRATORUM.

BEETLE-TICK.

APTERA.

No wings.

GENERIC CHARACTER.

Legs eight. Eyes two, lateral. Tentaculæ two, jointed.

SPECIFIC CHARACTER.

Tawny. Anus whitish.

Syst. Ent. 814. 24. *Linn. Syst. Nat.* 2. 1026. 27. *Fn. Sv.* 1973.

This Tick is one of those detestable race of animals whose minuteness secures it from danger, while it draws nutriment from the blood, and frequently from the vitals of larger insects. Every animal is tormented by those cruel and blood-thirsty beings, varying in size, in shape, and in colour, but whether they be distinguished by the name of lice, bugs, fleas, or mites, they fall under one point of view, when considered as a pest to the societies of other animals.

Beetles are in general infested and severely injured by those vermin. I found about a month since one of the *Scarabæus Stercorarius*, Con-

E

mon

men Dor, or *Clock*, almost devoured alive by them, little except his shell remaining; yet, in this state it lived several days. There were a number of small brown bags affixed by pedicles to its breast, thighs and even feet; the microscope discovered those to contain each an embryo, and the pedicle, no doubt, answered the part of an umbilical chord, to extract nourishment from the living creature. I perceived on further inspection their base penetrated the shell, or entered the apertures.

FIG. 1. Natural size of the Ticket and Embryo.

FIG. 2. The upper side, and Fig. 3. under side, magnified.

GRADUAL, from these what numerous kinds descend,
Evading even the microscopic eye!
All Nature swarms with life; one wond'rous mass
Of Animals or Atoms organized,
Waiting the vital breath, when PARENT HEAVEN
Shall bid his Spirit blow. — — — — —

— — — — — These, conceal'd
By the kind art of forming HEAVEN, escape
The grosser eye of man: for, if the worlds
In worlds inclos'd, should on his senses burst,
From cates ambrosial, and the nectar'd bowl
He would abhorrent turn: and in dead night
When silence sleeps o'er all, be stunn'd with noise.

THOMSON'S SEASONS.

P L A T E





P L A T E X I I .

CICINDELA CAMPESTRIS.

SPARKLER.

COLEOPTERA.

Wings two, covered by two shells, divided by a longitudinal future.

GENERIC CHARACTER.

Antennæ taper. Jaws prominent, denticulated. Eyes prominent, Thorax margined. Five joints in each foot.

SPECIFIC CHARACTER.

Above green-gold. Beneath copper tinged. Eyes large. Thorax angular and narrower than the head. Six spots on each shell. An oval substance at the base of each thigh. Legs long and slender.

Syst. Ent. 224. 1. *Linn. Syst. Nat.* 2. 657. 1. *Fn. Sv.* 746. *Scop. carn.* 181.

Those beautiful Insects vary something in size and colour, the spots on the elytra are generally white, but are often found with spots of yellow; they fly or run quick, are carnivorous, and live in dry sandy places. In the spring its larva is found, which resembles a long, soft, whitish worm, with six legs and a brown scaly head; it perforates
the

the sand perpendicularly, and rests near the surface to ensnare smaller insects.

It very difficult, if at all possible, to breed those insects and observe their metamorphoses; we have tried various methods, but have not yet been so fortunate as to succeed.

These beautiful insects were reared in the same manner as the others on the same diet, but we often found with them of yellow; they fly or run much the same manner, and live in the same places. In the spring we have found them, which resembles a long, thin, white worm, with the legs and a brownish head; it possesses the



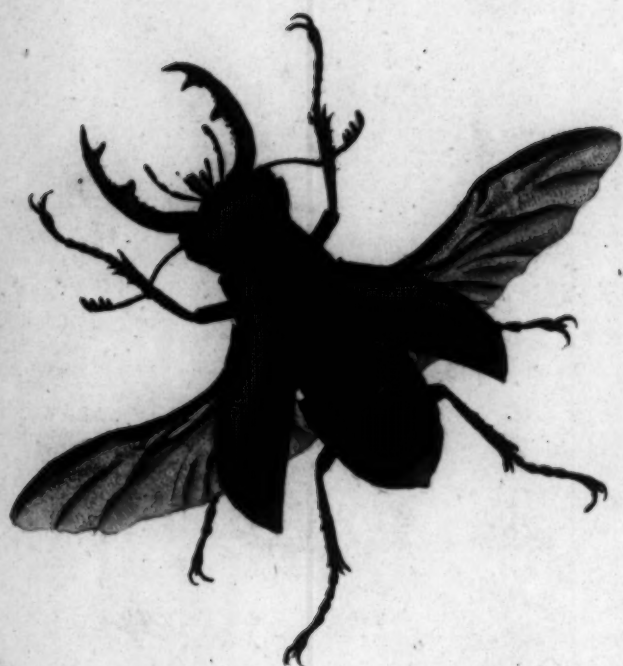


PLATE XIII.

LUCANUS CERVUS.

STAG BEETLE.

COLEOPTERA.

GENERIC CHARACTER.

Antennæ clavated, compressed, pectinato-fiffile. Maxillæ extended so as to resemble horns. Five joints in each foot.

SPECIFIC CHARACTER.

Head and Thorax black. Shells dark brown. Horns resembling those of a Stag, forked at the end, a small branch near the middle on the inside, moveable. Shells plain.

The Stag-Beetle is the largest coleopterous insect we possess, but its size is insignificant, when compared with those of the same kind that inhabit hot countries or woodlands, as instanced in the *Scarabæus Hercules*, &c.

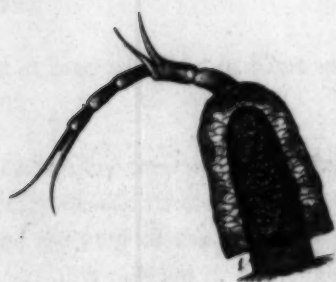
It is sufficiently distinguished in this country by the moveable maxillæ, or jaws, that project from the head; they are of a dark red colour, and though brighter in some specimens, are rarely of the beautiful coral appearance *Barbut* and other authors have described.

Coleopterous insects in general are endowed with amazing strength, and their arms are equally serviceable for the assault or defence. The antlers of this Beetle are carefully to be avoided by such as attempt to deprive it of liberty; with them it strips off the bark of oak trees, and attaches itself firmly to the trunk, thence extracting the liquor that oozes with its tongue.

They are plentiful in June and July, in Kent and Essex, and in many other parts of Britain.

The females are known by their maxillæ being much shorter than those of the males; they deposit their eggs under the bark of old trees, either oak or ash, and the food of the larvæ, or grubs, is the internal substance of the trunk, first reduced to a fine powder; they undergo transformation in this cell, and force a passage through the bark when perfect beetles.





P L A T E X I V .

T R I C H O D A P O C I L L U M .

T R I C H O D A .

An invifible, pellucid, hairy worm.

SPECIFIC CHARACTER.

Oblong trichoda, the fore-part truncated and hairy, the tail articulated, and divided into two bristles.

This invifible animalculum is common in marfhy places, particularly in the fwamps near the banks of the river Thames.

When magnified, the body is pellucid, and appears as two feparate bodies, one enclosing the other; the interior part is filled with molecules, and the exterior is membranaceous: they are capable of extension or dilation, and of folding in various directions. At the extremity of the interior part is a muscular orbicular membrane, which is opened or fhut at pleafure, and forms the mouth.

FIG. 1. The interior part protruded with the mouth open.

FIG. 2. The jaws fhut.

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PLATE XV.

PHALÆNA CAJA.

GREAT TYGER MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ taper from the base. No trunk. Wings depressed, deflexed. Back smooth.

SPECIFIC CHARACTER.

Antennæ feathered. First wings whitish, with large irregular dark brown spots. Abdomen and second wings orange, with black spots.

The superior wings in some of this species have smaller brown spots, and more of the cream colour; in others the spots are larger, and frequently two are united to form one. The inferior wings also admit of equal variety; the spots near the thorax are often united, and the small black stripes on the back are fewer in the present specimen than are common to the Moth.

The

The caterpillars feed on lettuces, or nettles. When he is apprehensive of danger, he rolls himself up like a hedge-hog. He becomes a chrysalis in May; and the latter end of June, or early in July, it produces the Moth.





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PLATE XVI.

PHALÆNA ANTIQUA.

WHITE SPOT TUSsock Moth,
OR
VAPOURER.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ taper from the base. No trunk. Wings depressed. Back hairy.

SPECIFIC CHARACTER.

Antennæ feathered. First wings cloudy, orange, waved and spotted with brown, and a white spot on the posterior angle. Female without wings.

The female Vapourer Moth at first sight perfectly resembles an apterous insect; but on inspection, very small wings are seen at the extremity of the Thorax, and the antennæ determine it to be a phalæna. It creeps in a sluggish manner, and lays an abundance of eggs.

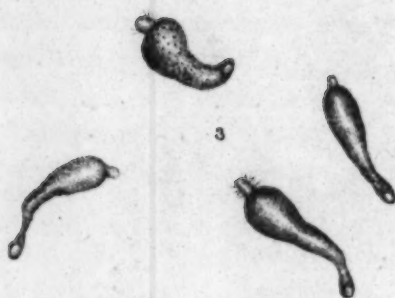
FIG. 1. the Female. FIG. 2. the Male.

The

The Caterpillars feed on white thorn, and on trees in general. It has been known to live on the deadly night-shade, and other poisonous plants. The Caterpillars are found in July, and the Moth in September.

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ous
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P L A T E X V I I .

VORTICELLA URCEOLARIS.

GENERIC CHARACTER.

A small animal, with a vascular cup; the mouth is at one end ciliated, and capable of being contracted; the stem fixed.

SPECIFIC CHARACTER.

Single, with a short tail, and toothed mouth.

This Animalcum is but perceptible to the naked eye, appearing as a small white speck; the microscope discovers the external covering to be so transparent, that all the motions of the animal within are perfectly distinct. It hath a double rotatory instrument, which, however, it can conceal or shew at pleasure; and it hath power to protrude the head and tail as at FIG. 1. or to contract them within the external coat or covering, as at FIG. 2.—When the animal intends to display its rotatory instrument, it forces its tail through the hole at the extremity of the outer coat, and affixes it to whatever substance is near; but when it swims, it moves its tail backwards and forwards to assist it.

They are found in river, or stagnant, water.

G

F I G.

F I G. I I I .

T R I C H O D A V E R M I C U L A R I S ,

GENERIC CHARACTER.

An invisible, pellucid, hairy worm.

SPECIFIC CHARACTER.

Long cylindrical trichoda, with a short neck, the apex hairy.

Is found in river water, and can assume various forms, as in our figure shewn.





P L A T E XVIII,

N E P A C I N E R E A,

W A T E R S C O R P I O N,

H E M I P T E R A,

G E N E R I C C H A R A C T E R,

Antennæ, or fore legs, cheliform, wings crossed and complicated; fore part coriaceous.

S P E C I F I C C H A R A C T E R,

Black brown. Head small. Antennæ cheliform. Thorax almost square. Tarsus large, brown. Shells large. One joint in each foot. Length near an inch. In the female the abdomen terminates in two long appendices. Four legs only.

There are three species only of this genus common to our waters, though the waters of hot countries abound with various kinds, some considerably exceeding in size even our *Sphinx Atropos*.

The Insect sinks its eggs into the cavity of a rush, or other aquatic plant, whence the larvæ are hatched. The perfect insect is found in

June, and thence to September or later; they are voracious, and feed on other aquatic animals, grasping their prey between their fore feet, and tearing them to pieces with their sharp rostrum.—They fly in the evening, and thus remove in herds from one pool to another when danger approaches.

It is supposed by some authors, that the fore feet of the nepa are the antennæ, and if this be admitted, the Insect hath only four feet; but if considered destitute of its antennæ, it hath six.





P L A T E X I X.

C H R Y S I S B I D E N T A T A.

H Y M E N O P T E R A.

GENERIC CHARACTER.

Thorax joined to the abdomen by a short pedicle. Abdomen divided into three segments. Sting simple. Wings not folded. Antennæ filiform of one long and eleven short joints each.

SPECIFIC CHARACTER.

Head and last segment of the body, sky blue, changeable. Thorax, and two first annulations of the abdomen, crimson with gold spots. Thorax with two teeth.

The Chrysis Bidentata is scarcely so large, and by no means so common as the Chrysis Ignita, (not exceeding one-third of an inch in length) but is equal, if not superior in beauty and richness of colour. The head, but more particularly the last segment of the body, appears in one direction of light, blue, in another green, in another purple, &c. and the thorax, and two first segments of the abdomen are far more enriched with a golden appearance; the ground colour is deep crimson, but the metallic appearance on the lighter parts, and the number of small gold spots which besprinkle it, greatly diminish the strength of colour, and renders it, even before it is magnified, a superb little insect.

It is found in May or June in some parts of Kent and Essex.

XIX. TABLE

It is found in May as far as in some parts of Kent and Essex.





P L A T E XX.

F I G. I

P H A L Æ N A C H R I S T I E R N A N A.

L E P I D O P T E R A.

G E N E R I C C H A R A C T E R.

Pyralis.

S P E C I F I C C H A R A C T E R.

First wings yellow, with rose-coloured marks. Under wings flossy, brownish grey.

The natural history of this *Phalæna* is so little known, that we freely confess our inability to shew its transformations; and although a deviation from our first intention, we trust the scarcity of the Fly will plead our excuse. We shall occasionally introduce figures of some rare and non-descript subjects, which we hope will be highly satisfactory to many of our subscribers.

Our specimen was taken at Feversham; they are sometimes met with about Darnwood in June or July.

F I G.

FIG. II.

HIMANTOPUS LUDIO.

GENERIC CHARACTER.

A pellucid, invifible, cirrated worm.

SPECIFIC CHARACTER.

Curled Himantopus; the upper part hairy, the tail extended upwards.



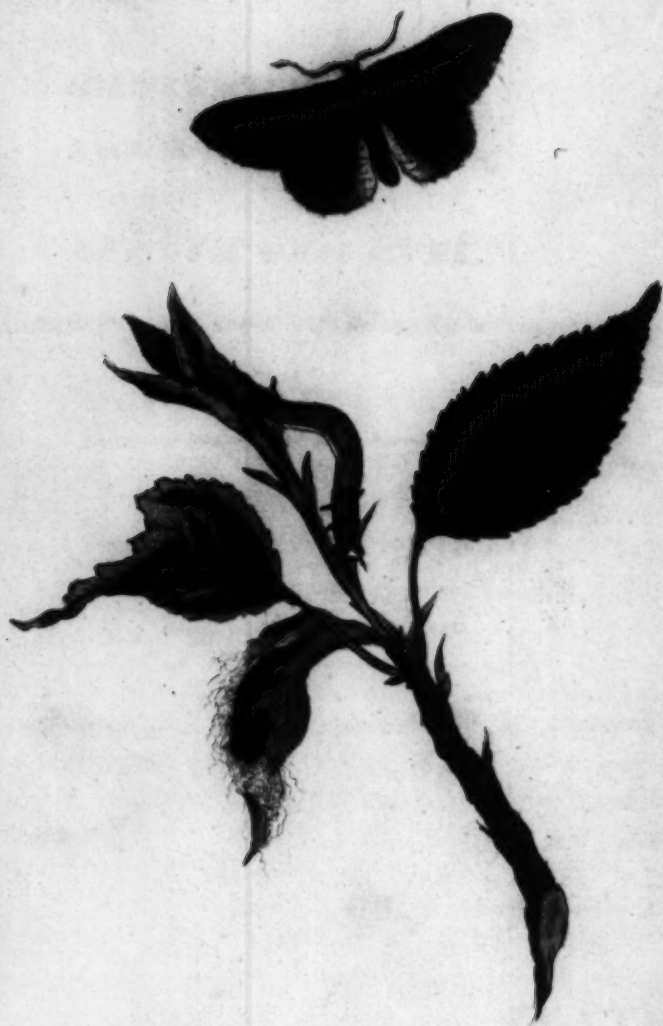


PLATE XXI.

PHALÆNA PRUNARIA.

ORANGE MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Geometræ. Antennæ feathered.

SPECIFIC CHARACTER.

Wings orange, sprinkled with brown, and a semi-lunar spot on the first pair. Female paler than the male. Caterpillar yellow brown, with two spines before and two behind.

The caterpillars of this Moth feed on fruit-trees, or on thorns, in the month of May; the Chrysalis is commonly found, rolled up in a decayed leaf, inwardly protected by the web, in June; and in July the Moth.

The present figure is of the male.

PLATE

PLATE XXI

PHALANX PERNARIA

ORIGIN

DESCRIPTION

GENERIC CHARACTER

CHARACTER

GENERIC CHARACTER

Wings are light brown with brown and a few dark spots on the
hind part. Tarsus pale brown. Claws yellow brown.
with two lines below and two behind.

The caterpillars of this moth feed on shrub trees, or on leaves, in
the month of May; the Chrysalis is commonly found under the
decayed leaf, hatched in June; and the fly
in March.

The perfect figure is of the male.

PLATE





P L A T E XXII.

T I P U L A P L U M O S A.

SEA TIPULA.

DIPTERA.

GENERIC CHARACTER.

Head long. Palpi four, curved. Trunk very short.

SPECIFIC CHARACTER.

Brown. Thorax greenish. Eyes black. Fore legs longest. Wings shorter than the abdomen.

Is found in the month of April near marshes, and has been frequently mistaken for the common Gnat.

PLATE XXII

THE BULBUL

THE BULBUL

THE BULBUL

THE BULBUL

THE BULBUL

THE BULBUL

THE BULBUL

is found in the month of April near ...
usually mistaken for the common ...





P L A T E X X I I I .

S I L P H A V E S P I L L O .

C O L E O P T E R A .

GENERIC CHARACTER.

Antennæ clavated, foliated. Head prominent. Thorax margined.

SPECIFIC CHARACTER.

Margin of the thorax broad. Shells abbreviated, black, with two orange belts. Thigh of the hind legs large, with a spine near their origin; length one inch.

This species, like most of the Coleopterous Insects, delights in filth and putrescence, and are rarely found except in the dung, or dead bodies of larger animals, whose entrails they devour; they prey on the larvæ of smaller insects beneath the surface of the earth, or they will destroy each other. Their Grubs are secreted in perforations made in the earth by the female, and therein they change to their last or perfect state in June or July: those Grubs are to be found by following the track of a plough.

They fly well with the transparent wings, which are concealed beneath the Elytra or upper Shells. The male is rather smaller than the female, and the orange belts are of a deeper hue: though both male and female vary in the strength of colour when alive, and yet more when preserved in cabinets, as they sometimes become almost brown. All insects are subject to this change, whatever may be the care of the collector.

PLATE XXIII

31146-73211

GENERAL REMARKS

These are the most common of the fossils found in the

2230-2235

The fossils are found in the same strata as the other fossils, and are of the same size and shape. They are found in the same strata as the other fossils, and are of the same size and shape.

The fossils are found in the same strata as the other fossils, and are of the same size and shape. They are found in the same strata as the other fossils, and are of the same size and shape.

The fossils are found in the same strata as the other fossils, and are of the same size and shape. They are found in the same strata as the other fossils, and are of the same size and shape.





P L A T E XXIV.

LIBELLULA DEPRESSA.

D R A G O N F L Y.

NEUROPTERA.

Wings four, naked, transparent, reticulated with veins or nerves.
Tail without a sting.

GENERIC CHARACTER.

Mouth with two long lateral jaws. Antennæ very short. Tail of the male forked. Wings extended.

SPECIFIC CHARACTER.

Eyes brown. Thorax greenish, with two yellow transverse bands. A large black spot at the base of each Wing, and a small dark mark on their exterior margin. Body depressed, lance-shaped.

All the species of *Libellula*, but particularly the larger kinds, are considered by many rather as objects of terror, than subjects worthy inspection; and the vulgar denomination of *Horse-flinger*, contributes to this abhorrence: although it hath no power over animals of such magnitude, it is perfectly a Vulture among lepidopterous, or other defenceless Insects, destroying more for its sport than for its voracious appetite.

The Fly is on the wing in May, and June, in almost every marshy situation; the female lays her eggs near the roots of Osiers on the banks of ditches, or sinks them into the stalks of Rushes in the water; they hatch, and an ugly apterous insect, of a brown colour, comes forth;

forth; it hath a long body like the Fly, six Legs, and a forked Head, a sharp spine at the extremity of the abdomen, and a row of spines on each side, one at every joint; it plunges into the water, and immediately devours such of the inhabitants, or their eggs, as comes within its reach, and it continues this life of depredation until its next change. They are to be taken with a small hand-net.

All transparent objects, in a certain direction before a microscope, reflect the colours of the prism. The *Tipula Plumosa* exhibits, in this situation, an effulgence of colouring, which its natural size conveys but small vestiges of; and the colours on the wing of this *Libellula* appears far more vivid when magnified.

The body of the male is bluish grey; the present specimen is the female.





P L A T E XXV.

SPHINX API-FORMIS.

BEE HORNET SPHINX.

GENERIC CHARACTER.

Antennæ thickest in the middle. Wings, when at rest, deflexed.

SPECIFIC CHARACTER.

Wings transparent, with brown veins. Abdomen yellow, the first and fourth division from the thorax dark, purplish. Thorax brown, with two yellow patches in front. Head yellow. Antennæ dark brown. *Linn. Syst. Nat.*

The Caterpillar of the *Sphinx Api-formis* is an internal feeder, and found only by making an incision into the innermost substance of the Poplar, the only tree the female commonly deposits her Eggs on; it is to us unknown, as is also the time of continuing within the trunk of the tree; but in June, early in the morning, or in the evening, the Chrysalis is seen issuing through the bark, from a perforation in the trunk, which the Caterpillar had formed previous to its change, generally to the depth of six or eight inches, or more. Nature has furnished every segment of the Chrysalis with a double row of sharp teeth, or spines, therewith it firmly attaches itself to the sides of the cavity, and, by repeated exertions to break from its prison, gradually comes forth; thus, when it hath extricated itself from the tree, and the Chrysalis is supported as in our Plate represented, the upper parts burst asunder with violence, and the insect rushes forth to enjoy "the temperature of the summer season." It is rarely found except in Essex.

There is another *Sphinx*, which differs in so few particulars, that it hath been mistaken for the present subject; notwithstanding, it may be easily distinguished by a crescent of yellow in the fore part of the thorax, and thence entitled the *Lunar Hornet Sphinx*; a Drawing of which Insect, with the larva, has been presented to the *Linnean Society*. This larva is nearly the size of the Buff-tip Caterpillar, and of an obscure brown colour; probably the larva of the *Sp. Api-formis* may much resemble it.

It is arranged in many cabinets under the title of *Sphinx Vespi-formis*; but the *Sp. Vespi-formis*, in the *Linnean Collection*, now in the possession of Dr. Smith, scarcely exceeds half the size of this subject, and is probably unique. The *Lunar Hornet-Sphinx* had no place in that cabinet.



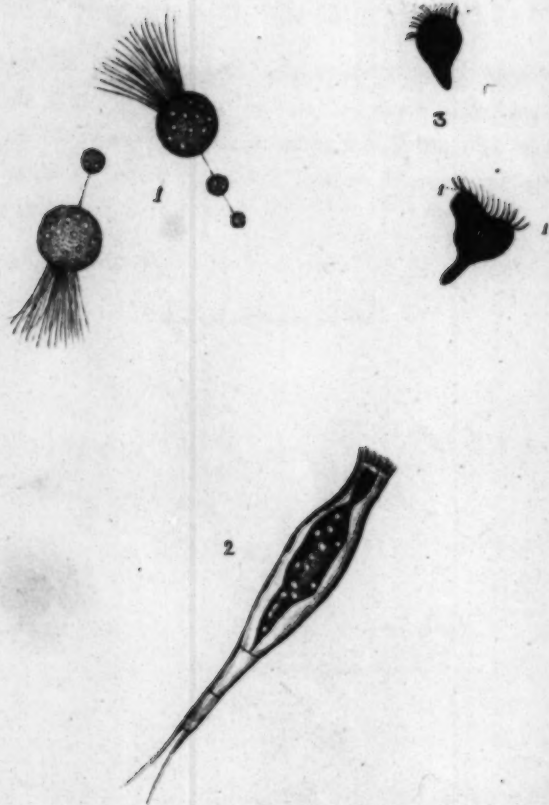


PLATE XXVI.

FIG. I.

TRICHODA COMETA.

GENERIC CHARACTER.

An invifible, pellucid, hairy Worm.

SPECIFIC CHARACTER.

Spherical, the fore part hairy, with an appendant globule.

FIG. II.

TRICHODA LONGICAUDA.

SPECIFIC CHARACTER.

Cylindrical, the first part truncated, and fet with hairs. The tail long, with two joints, and terminated by two bristles.

FIG. III.

VORTICELLA TROCHIFORMIS NIGRA.

GENERIC CHARACTER.

A Worm, capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Top-shaped black vorticella.

This species of Vorticella appears, without the assistance of a microscope, as small black specks, swimming on the water, particularly in meadows which are inundated. They are constantly in motion; and two small white hooks are perceptible by glasses at 1—1; by the help of those it is supposed to swim, or they may inclose some rotatory organ. The insect is opaque.



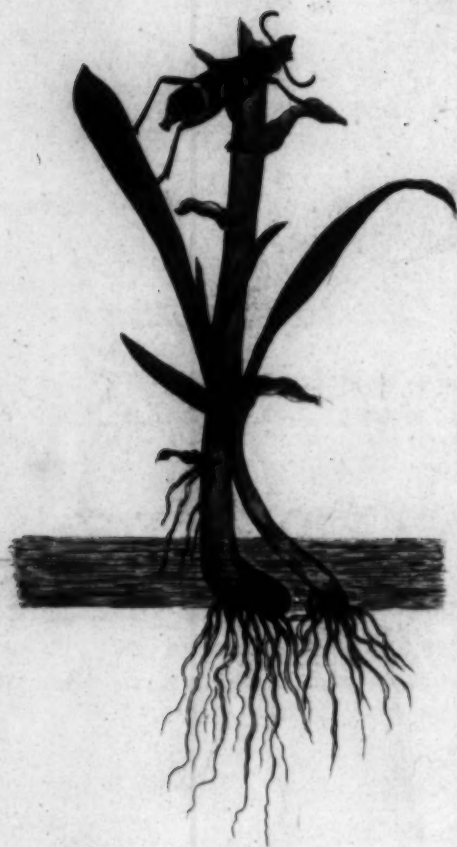


PLATE XXVII.

LEPTURA ARIETIS.

COMMON WASP BEETLE.

COLEOPTERA.

GENERIC CHARACTER.

Antennæ tapering to the end. Shells narrower at the apex. Thorax somewhat cylindrical.

SPECIFIC CHARACTER.

Black. Anterior and posterior margin of the Corset yellow. Four yellow lines on each elytra or Shell. *Lin. Syst. Nat.*

They fly well, and are sometimes found on aquatic plants. They are exceedingly numerous in Kent, in the pease and bean-fields, in May, or on the currant-bushes, and not unfrequently are taken on the fern.

P L A T E XXVII

BEETLE ANTHUS

Common in the North

of America

Common in the North

of America

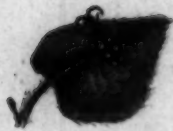
Common in the North

of America

They are well known in the North of America. They are common in the North of America. They are common in the North of America.

PLATE





P L A T E XXVIII.

CHRY SOM E L A A S P A R A G I

COLEOPTERA.

GENERIC CHARACTER.

Antennæ knotted, enlarging towards the ends. Corset margined, and body oblong. Thorax narrow.

SPECIFIC CHARACTER.

Head, Antennæ, and under side of the Body black. Thorax red, with two black spots. Shells dark green, with six yellow spots. Length one line. *Lin. Syst. Nat.*

This pretty Cloeopterous Insect is found in June on the Asparagus, when in seed. Linnæus calls it *Asparagi*, from the larvæ feeding on the leaves of that plant. It is a common insect, but forms a beautiful opaque object for the microscope. The natural size is given at Fig. I. and the magnified appearance above.

PLATE XXVIII

CHRYSOMELA ASPARAGI

COLEOPTERA

GENERIC CHARACTER

Antennae knotted, enlarging towards the end. Gaster very long and body oblong. Thorax narrow.

SPECIFIC CHARACTER

Head, Antennae, and under side of the body black. Thorax red, with two black spots. Shells dark green, with two black spots. Length one line. Lin. 526. 24.

This pretty Chrysomelid is found in 1811 on the Asparagus when in leaf. Linnæus calls it *Asparagivora*, from the larva feeding on the leaves of that plant. It is a common insect, but forms a beautiful species only for the microscope. The natural size is given at Fig. 1. and the magnified appearance above.





XIX [63]
P L A T E XXIX.

F I G. I.
TRICHODA MELITEA.

GENERIC CHARACTER.

An invifible, pellucid, hairy Worm.

SPECIFIC CHARACTER.

Oblong ciliated trichoda, with a dilatable neck, the apex globular, and furrounded with hairs. *Müller's Animalcula Infusoria*, &c.

Invifible to the naked eye, and rarely found except in falt-waters, although we have met with one fpecimen in the water of the Thames.

F I G. II.
VORTICELLA NASUTA.

GENERIC CHARACTER.

A Worm, capable of contracting or extending itfelf, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Cylindrical, with a prominent point in the middle of the cup. *Müller's Anim. Infuf.*

Is invifible to the naked eye, and appears of an unequal fize before the microfcope is pellucid, with the fore part truncated and ciliated, and moves in the water with great alertnefs, by the affiftance of the circle of hairs which encompass the body.

L

F I G.

VORTICELLA VIRIDIS.

GENERIC CHARACTER.

A worm capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Cylindrical uniform, green, and opake. *Müller's Anim. Infus.*

The naked eye discovers this species as a mere point: when magnified it is of a dark green colour, almost opake, nearly cylindrical, obtuse at the extremities, and destitute of limbs. It moves circularly, or in a strait direction, and causes such an agitation of the water, that notwithstanding its appearance, some rotatory instrument must be concealed within the body, which the insect can put forth at pleasure.

PLATE XIX

SHALBUT KAYU





PLATE XXX.

PHALÆNA SALICIS.

WHITE SATTIN MOTH.

GENERIC CHARACTER.

** No trunk, wings depressed, deflexed, back smooth.

SPECIFIC CHARACTER.

Antennæ feathered. Body and wings white.
Caterpillar black, with red and white spots.

Are very numerous in the adjacent parts of London, and are found in the state of Caterpillar, Chrysalis and Moth, at the same time, though commonly the Caterpillar changes to Chrysalis in June, and to a Fly in July.

It feeds on the Willow, the Ozier, the Poplar, &c.





PLATE XXXI.

FIG. I.

MUSCA CHAMÆLEON.

DIPTERA.

Two Wings.

GENERIC CHARACTER.

Musca, a soft flexible Trunk with lateral Lips at the end. No palpi;

SPECIFIC CHARACTER.

Dark brown or black. Antennæ taper, broken. Eyes large. Abdomen nearly circular, with three triangular yellow spots on each Side, and one at the extremity.

Linnæus, in a former edition of the *Fauna Suecica* gave this insect the name of *Oestrus Aquæ*, but he afterwards discovered it to be a *Musca*, and called it *Musca Chamæleon*. It is one of the most common Dipterous, or two-winged Insects we have; yet though so well known in its perfect state, few have attended so minutely to its changes as to discover that; they form the most singular part of its history.—The female deposits her eggs in the hollow stalks of aquatic plants, or broken reeds, or so provides for them that they cannot, but by some unforeseen accident, be carried away. The egg, in due time ripening, produces a Larva, no way resembling the Parent, but rather a Worm

of a most singular structure. This happens about the latter end of *May*, or beginning of *June*, if the weather proves favourable; they will then be found in shallow standing waters, crawling on the grafs or plants which grow there, or they may be taken floating on the surface of the water. The Body consists of twelve annular divisions, whereof the Head and Tail are two; the Tail has a verge of hairs, which, when entirely expanded, support the creature on the surface, with its head downwards. If it wishes to descend, it contracts the hairs in the form of a wine glass, or entirely closes them at the end; and when again it is rising to the surface, it forces a bubble from a small aperture in the center, which immediately makes a passage for its ascension.— It changes to the Pupa state, and about the middle of *July* to the Fly. It subsists at this time on the nectar and other juices it extracts from the bottom of the corolla in flowers.

FIG;

FIG. II.

MUSCA PENDULA.

DIPTERA.

MUSCA.

SPECIFIC CHARACTER.

Head black. Thorax yellow, with three longitudinal black lines. Abdomen yellow, with transverse black marks.

Its habits nearly correspond with those of the *Musca Chamæleon*. Like that Insect it once wore the appearance of an Aquatic, and like it also in its last or perfect state, exists by extracting with its Trunk the nectar from flowers. It is to be taken in *June*.

FIG. III.

MUSCA LATERALIS.

DIPTERA.

MUSCA.

SPECIFIC CHARACTER.

* Thorax black. Abdomen bright red or brown, with a line of black from the Thorax; the last segment black, with hairs or spines.

Visits flower gardens in the month of *June*.

PLATE XXX





PLATE XXXII.

FIG. I.

VIBRIO OLOR.

GENERIC CHARACTER.

An invisible Worm, very simple, round, and rather long.

SPECIFIC CHARACTER.

Elliptical, with a very long Neck, and a knob on the Apex.—
Müller's Ani. Inf.

The Neck of this Creature is in continual motion, and the whole Body is dilatable. It is found in water, replete with decayed vegetables.

FIG. II.

KOLPODA MILEAGRIS.

GENERIC CHARACTER.

An invisible, very simple, pellucid, flat, crooked Worm.

SPECIFIC CHARACTER.

Changeable, with the fore part like a hook, the hind part folded up.—*Müller's Ani. Inf.*

FIG.

FIG. III. and FIG. IV.

P R O T E U S T E N A X.

G E N E R I C C H A R A C T E R.

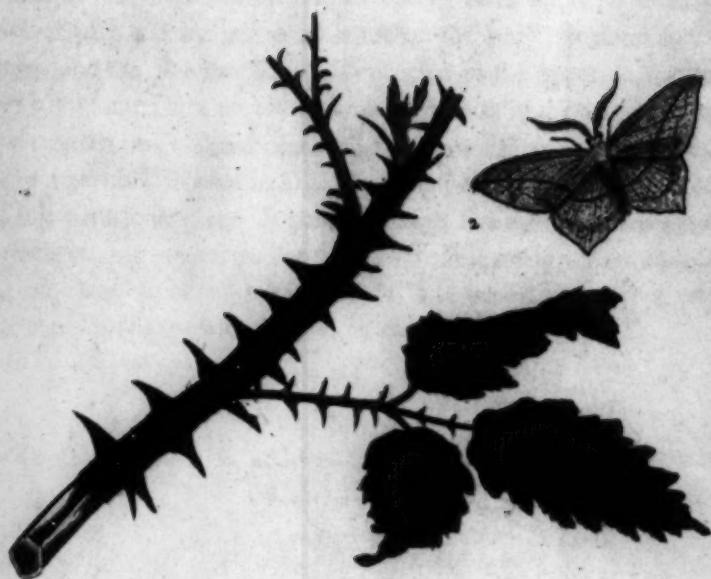
An invifible, very fimple, pellucid Worm, of a variable form,

S P E C I F I C C H A R A C T E R.

Running out into a fine point.—*Müller.*

A gelatinous pellucid body, ftored with black molecules; it changes its form in a regular order, firft extending itfelf out in a ftrait line, the lower part terminating in an acute bright point, without any in-teftines, and the globules being all collected in the upper part, it next draws the pointed end up towards the middle of the body, fwelling it into a round form. The contraction goes on for fome time, after which the lower part is fwelled as in Fig. IV. The point is afterwards projected from this ventricofe part. It paffes through five different forms before it arrives at that reprefented at Fig. IV. It fcarcely moves from one fpot, only bending about fide ways. It is to be found in river water, where the *Nitida* grows.—*Adams on the Microscope.*





P L A T E X X X I I I .

F I G . I .

P H A L Æ N A B A T I S .

PEACH-BLOSSOM MOTH.

LEPIDOPTERA.

P H A L Æ N A .

GENERIC CHARACTER.

Antennæ taper from their apex. Wings in general contracted when at rest. Fly by night.

* NOCTUA.

SPECIFIC CHARACTER.

First pair of Wings brown, with five peach-coloured spots on each. Second pair light brown.

The Peach-blossom Moth at first sight so evidently distinguishes itself, that it can scarcely be mistaken. The upper or first pair of Wings have the ground of a brown colour, which in some directions of light assume a golden appearance; and on each Wing are five elegantly disposed spots of white, having each a center of the most beautiful bloom, or blossom colour, which blend into the white with the most exquisite softness. The under Wings are of a simple colour, and have only a transverse shade of a darker hue across the middle of each Wing.

Its truly elegant appearance would alone be sufficient to claim our attention; but when we add that it is one of the rarest and most valuable

valuable specimens of British entomology, it will be considered as a compensation for those more common subjects occasionally introduced, and which the nature of our plan cannot permit us to refuse.

Our endeavours to procure the Caterpillar have hitherto been ineffectual, although it is very probably to be taken early in the season, feeding on the bramble. It is described to be a brown larva, naked, or without hairs, with a gibbosity or rising on the back, near the extremity.

Our Fly was taken in Essex, July 14th.

F I G. I I .

P H A L Æ N A A M A T O R I O .

BLOOD VEIN, or BUFF ARGOS MOTH.

LEPIDOPTERA.

P H A L Æ N A .

** Antennæ feathered.

SPECIFIC CHARACTER.

Wings angulated, buff, sprinkled with brown, and a red transverse line across each. Margin of each Wing edged with red,

The Caterpillars of this *Phalæna* feed on the oak leaves. They are green, with yellow rings. The Fly is found in Essex very commonly in the month of July.





P L A T E X X X I V .

F I G . I .

CURCULIO BACHUS.

COLEOPTERA.

Wings two, covered by two shells, divided by a longitudinal suture.

G E N E R I C C H A R A C T E R .

Antennæ clavated, elbowed in the middle, and fixed in the Snout; which is prominent and horny. Joints four to each foot.

S P E C I F I C C H A R A C T E R .

Shells, and Thorax purple with gold shades; snout long, black.
Linn. Syst. Nat. 2. 611. 38. *Schæff. Icon. Tab.* 37. *Fig.* 13. *Geoff. Inf.* 1. 270. 4. *Sul. Hist. Inf. Tab.* 4. *Fig.* 4.

Our figure represents the *Curculio Bachus*, as it appears before the Speculum of an *Opake Microscope with a lens magnifying times*.

It is with this, as with many other species of insects, and particularly those of the Coleopterous Order, that unless they are in some measure magnified, much of their beauty will remain hidden, and much of their structure be enveloped in obscurity. It is not perfectly agreeable to our plan, and may admit of some blame from our subscribers; but when objects so diminutive in size, and so complex in colour, offer to our attention, and it is not possible to represent them in their natural appearance, or in a manner satisfactory to ourselves, we must have recourse to the Microscope for assistance. We consider the confidence at present reposed in our accuracy, and attention, to the natural subjects, evident from the general patronage bestowed on our attempt; it is a spur to our exertions, and we will endeavour, as well by our future, as present correctness, to deserve a continuation of

N

that

that esteem, and encouragement, so liberally showered on our once arduous undertaking.

C. Bachus is near in length, the Shells and Thorax appear of a deep glossy purple, with much inclination to gold; a green and golden hue is seen on every part of the body as it moves in various directions of light. The whole appears before the microscope besprinkled, and spotted with gold and purple; gold in those parts where the light is most powerful, and purple in the shadows. The Snout is black, or of a dark colour, as are also the Eyes; and the singular structure of the jointed Antennæ, which are thereon, deserve particular notice. This beautiful insect is as rare, as it is superb, and the larva is scarcely, if at all known.—Our specimen was taken in the middle of June, in a field near Kent.

F I G. II.

CUCULIO. GERMANUS.

BLACK CURCULIO.

COLEOPTERA.

Curculio.

SPECIFIC CHARACTER.

Snout long, black Head, Thorax, Shells and Body black. Two small spots of yellowish white on the sides of the Thorax.

Linn. Syst. Nat. 2. 613. 58. *Scop. Ann. Hist. Nat.* 5. 91. 44. *Friseb. Inf.* 13. 28. Tab. 26.

An Insect found in abundance in Germany, and by no means uncommon in this and every other part of Europe. It is generally taken in June.

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P L A T E X X X V .

F I G. I.

Shews the natural size of the larva, of the

MUSCA CHAMÆLEON,

Described in Plate XXXI of this work.

F I G. II.

As it appears magnified, We have taken it since that plate was finished, or we would have introduced it with the Fly. Being unacquainted with any perfect representation of this aquatic larva, we are happy to give it before the completion of the first volume.





PLATE XXXVI.

FIG. I.

LIBELLULA PUELLA.

NEUROPTERA.

Wings four, naked, transparent, reticulated. With Veins or Nerves. Tail without a sting.

GENERIC CHARACTER.

Mouth with two long lateral Jaws. Antennæ very short, tail of the male forked. Wings extended,

SPECIFIC CHARACTER.

Body Saxon-greenish blue, Eyes distant, remote. Wings of equal length, with a cloud of brown in the middle, and without marginal spot. Length two inches.

Linn. Syst. Nat. 2. 904. 20. *Fan. Sv.* 1470.

It is neither so large as to infuse terror by its appearance, or so beautiful as to claim the first place in a collection of British insects: notwithstanding there are many inferior to it both in elegance, and colour. The whole of the body is a deep purplish blue, which reflects on one part, a most brilliant colour with a greenish cast, and the clouds on the wings contribute much to its lustre. The Thorax and Head are nearly the same, some few shades of green excepted.

It

It is found in *May* and *June*, sporting on the waters, or among the bushes which overgrow the sides of pools, or gently flowing streams; at noon, or after a shower, when the sun breaks from its watery prison, and penetrates the thickets, and the groves with inviting warmth, they are seen issuing from the dark retreat, and overhanging shrubbery; to bask and wanton in its effulgent beams, and fan the gently rising breeze with their lucid Wings. In many parts on the banks of the *Thames* they heighten the scene by the glow and richness of their colouring; the green, the blue, and the red; the yellow, purple, and the brown, in their richest tints, according to the species; and as they fly in various directions, display themselves in all their native elegance and splendor.

F I G. I I .
L I B E L L U L A P U E L L A .

N E U R O P T E R A .

L I B E L L U L A .

S P E C I F I C C H A R A C T E R .

Body red with yellow and black lines at each segment; thorax green with yellow stripes. Wings clear, with marginal spots,

The body is red, with a yellow band and black mark at every segment; the Thorax green, with longitudinal lines of yellow; the Wings are perfectly transparent, except a marginal spot on each. It is voracious, as are all the species of *Libellula*, whether in the larva or the winged state; it appears about the same time as the preceding, and is the produce of an aquatic larva.

P L A T E

I N D E X

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APTERA.

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P

NATURAL HISTORY

OF
BRITISH INSECTS

EXPLAINING THEM

BY THE REV. FRANK SINCLAIR

AND THE REV. JOHN G. REYNOLDS

OF THE UNIVERSITY OF OXFORD

ERRATA TO VOL. I.

PLATE XXXIV. for *magnifying times*, read *magnifying four times*
for 6. *Bachus* is near in length, read *C. Bachus*
is near four Lines in length

FIG. II. for *Cuculio*, read *Curculio*

APPENDIX A

TABLE XXIV. for comparing the results of the two methods of determining the rate of reaction in the case of the reaction between the two substances. The results are given in the following table.

